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United States Patent [19]**Falone et al.**[11] **Patent Number:** **5,944,617**[45] **Date of Patent:** ***Aug. 31, 1999****[54] VIBRATION ABSORBING MATERIAL FOR HANDLES OF SPORTING EQUIPMENT****[75] Inventors:** Thomas Falone, Mickleton, N.J.;
Richard S. Wyerman, Doylestown, Pa.**[73] Assignee:** Pendulum Corporation, Media, Pa.**[*] Notice:** This patent is subject to a terminal disclaimer.**[21] Appl. No.:** 08/868,357**[22] Filed:** Jun. 3, 1997**Related U.S. Application Data****[63]** Continuation-in-part of application No. 08/560,699, Nov. 20, 1995, Pat. No. 5,653,643.**[51] Int. Cl.⁶** A63B 53/14**[52] U.S. Cl.** 473/300; 473/523; 473/549;
473/568; 473/316**[58] Field of Search** 473/316, 321,
473/300, 303, 523, 549, 568**[56] References Cited****U.S. PATENT DOCUMENTS**

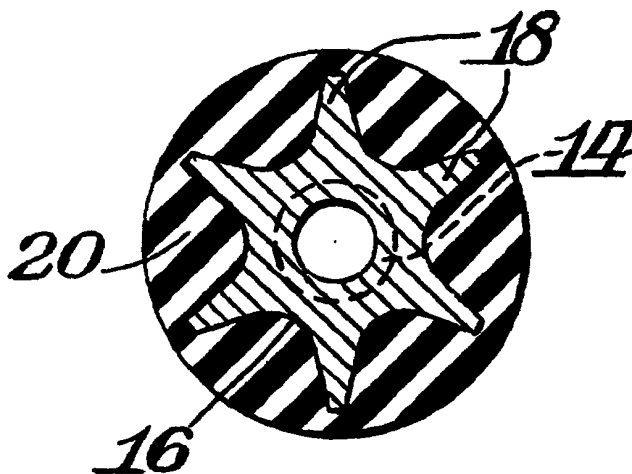
1,195,994	8/1916	Lard	473/316
1,551,203	8/1925	Mills	473/322
1,620,118	3/1927	Mattern	
2,871,899	2/1959	Coyle	81/177.1
3,353,981	11/1967	Jacob	
3,606,326	9/1971	Sparks et al.	
3,716,433	2/1973	Plummer	156/85
4,143,109	3/1979	Stockum	
4,147,443	4/1979	Skobel	
4,197,611	4/1980	Bell et al.	
4,261,367	4/1981	Uffindell	
4,268,574	5/1981	Peccenini et al.	
4,338,270	7/1982	Uffindell	
4,417,042	11/1983	Dziark	
4,483,972	11/1984	Mitchell	
4,552,713	11/1985	Cavicchioli	
4,591,160	5/1986	Piragino	

4,597,578	7/1986	Lancaster	
4,613,537	9/1986	Krupper	
4,660,832	4/1987	Shomo	
4,819,939	4/1989	Kobayashi	473/299
4,948,131	8/1990	Nakanishi	
4,953,862	9/1990	Uke et al.	
5,042,804	8/1991	Uke et al.	
5,088,734	2/1992	Glava	
5,110,653	5/1992	Landi	
5,122,405	6/1992	Landi	
5,137,769	8/1992	Landi	
5,193,246	3/1993	Huang	
5,199,706	4/1993	Chen	
5,203,561	4/1993	Lancot	
5,240,247	8/1993	Didier	
5,254,391	10/1993	Davis	
5,258,088	11/1993	Wu	
5,261,665	11/1993	Downey	
5,267,487	12/1993	Falco et al.	

(List continued on next page.)

OTHER PUBLICATIONS*American Journal of Physics*, vol. 38, No. 5 (May 1970),
"On the Dynamics of the Swing of a Golf Club".*Primary Examiner*—Jeanette Chapman*Assistant Examiner*—Stephen L. Blau*Attorney, Agent, or Firm*—Connolly & Hutz**[57] ABSTRACT**

A hand held article, such as a golf club, includes an elongated handle with an inner support structure mounted to the handle and a vibration absorbing material mounted around the inner support structure. The inner support structure includes a plurality of spaced rigid projections which extend into the vibration absorbing material to a location inwardly of the outer surface of the vibration absorbing material. In one embodiment the inner support structure is integral with the shaft of the handle. In another embodiment a sleeve is heat shrunk onto the shaft and the inner support structure and vibration absorbing material are mounted over the sleeve.

27 Claims, 3 Drawing Sheets

U.S. PATENT DOCUMENTS

5,269,516	12/1993	Janes	473/523	5,435,549	7/1995	Chen .	
5,282,618	2/1994	Hong .		5,524,885	6/1996	Heo	473/299
5,322,285	6/1994	Turner .		5,575,473	11/1996	Turner	473/298
5,333,861	8/1994	Mills .		5,653,643	8/1997	Falone	473/300
5,348,303	9/1994	Swissheim	473/201	5,686,158	11/1997	Gibbon .	
5,355,552	10/1994	Huang .		5,695,408	12/1997	DeLaCruz	473/300
5,362,046	11/1994	Sims .		5,730,662	3/1998	Rens	473/300
				5,749,798	5/1998	Kuebler	473/549

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